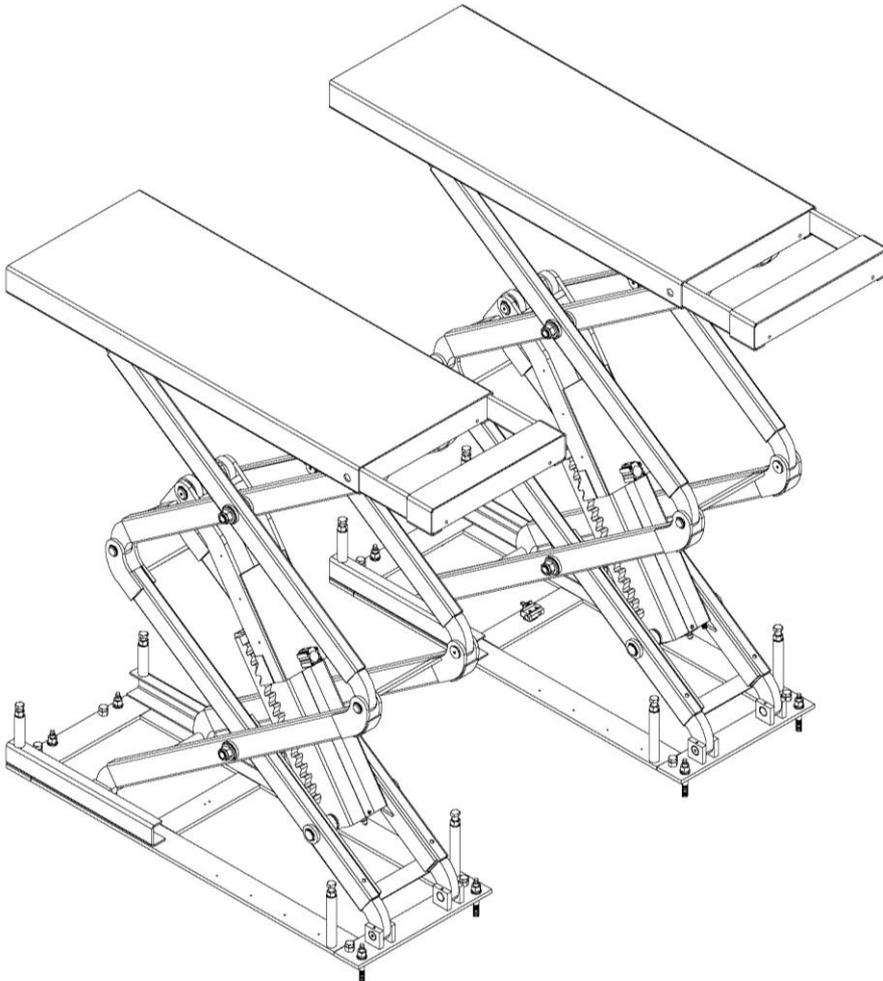


# Hydraulic Scissor lifter



*SF-E3500*



# User's Manual

# Hydraulic Scissor Lifter

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## Hydraulic Scissor Lifter



### Packaging, Transportation and Storage

All the operations such as packaging, handling, transportation and dismounting shall be operated by specialized technicians.

#### Package

**Standard configuration:** There are four standard configurations of oil pipe and a piece of accessory, a piece of main platform, a piece of auxiliary platform and a piece of control panel.

#### Encasement list

**Figure 1**

Case No.	Name	Name and quantity of the accessories
1.	Oil pipe and accessory	① Eight sets of M16×159 foot margin screw; ② Four pieces of foamy cushions; ③ One usage and maintenance manual; ④ Three pieces of φ 14 combined washers (auxiliary); ⑤ Ten pieces of bandages (250mm in length);
2.	Operation cabinet	① All the gas pipe connectors all in the control cabinet, excluding gas cylinder, connector on the gas cylinder and two pieces of gas pipes (gas cylinder, connector of the gas cylinder and two pieces of gas pipes are installed well) ② Limit switch and wires are in the control cabinet
3.	Main platform	
4.	Auxiliary platform	

#### Transportation



Goods shall be handled and moved by crane and fork lift truck weighing over 1 ton. To prevent goods from falling down, during the lifting operation, one person shall be in charge of observing the goods intently, so as to avoid accidents. The goods shall be transported by vehicles or liners.

The goods are transported by truck or steamship.

When the goods arrive at the destination, it is necessary to check whether the goods are complete to prevent damage and loss during the transportation. If there is any damage in the package, inspection to the damaged box shall be conducted by the *Encasement List* to confirm the situation about the damage and loss of goods. Meanwhile, it is necessary to notify the person that undertakes the transportation immediately.

**The machine is heavy goods! Manual loading, unloading and handling shall be beyond the consideration, safety during the operation is of great importance.**



#### Storage:

The machinery and equipment shall be placed in indoor warehouse and outdoor storage shall make good water-proof treatment.

Van truck shall be adopted during the transportation and goods shall be stored in containers if they are shipped by liners.

The control panel shall be kept upright during the transportation; in addition, extrusion of goods shall be avoided.

Environmental temperature for storage of machine: -25°C~55°C.

## Introduction of User's Manual



**This manual is intended for operators of vehicle maintenance enterprise and routine maintenance personnel.**

Before the lifter is operated, relevant personnel shall carefully read the *User's Manual*.

There is important relevant information in the manual:

- Personal safety of operators and maintenance personnel
- Safety in installation
- Safety operation of lifter



### **Please keep this manual**

This manual is an important part of the lifter

The manual shall be placed around the lifter, so that the operator and maintenance personnel can read it at any time

Please carefully read Chapter III, which contains important information on application and safety

### **The lifter is designed and manufactured by European Standard**



**Loading and unloading, transportation, dismounting, assembling, commissioning and testing; specially the maintenance, repair, overhaul, transportation and dismounting of lifter shall be executed by professionals with license.**

Injury of human and damage of the machine caused by operation of no-authorized personnel or operation not in accordance with the operating rules occur, the manufacturer bears no liability for this.



**The manual suggests: operation and safety is guarantee for operator and maintenance personnel. To better understand the structure and operating rules of the machine, please carefully read the User's Manual before you use the machine.**

To better understand the terms in the manual, operator shall possess experience on service at factory, maintenance and repair, etc. and can read the explanations in drawings and the manual and relevant special national safety ordinance on equipment installation.

This is also applicable to maintenance and the maintenance personnel shall possess special knowledge on machinery engineering

- Operator: Personnel that have been trained and authorized to use the lifter
- Maintenance personnel: Routine maintenance personnel that have been trained and authorized



**The manufacturer keeps the right of the minor modification of the manual due to advancement of technology**

## Chapter I: Description of Machine

### Machine usage

SF-E3500 small scissor plate hydraulic truck lifter can be used to lift all kinds of automobiles that weighs not more than 3,500kg and that are suitable for automobile repair, maintenance as well as tire disassembling and vehicle maintenance of automobile maintenance industry.

### Structural characteristics:

- The machine adopts concealing scissor structure with small occupation area
  - With independent control cabinet and low-voltage control, the safety performance of the machine is excellent
  - With hydraulic capacity synchronous oil cylinder, the operation of platform is synchronous and stable
  - With double safety devices of hydraulic lock and mechanical double-tooth safety claw, it is safe and reliable.
  - The lifter comprises a hydraulic failure and overload relief valve protection device and a throttling valve device, so that the machine can be prevented from dropping quickly when the oil pipe is broken
  - The machine adopts good quality hydraulic and electric components from Italy, Germany and Japan, etc.
- The platform length can be adjusted to adapt to kinds of vehicle
- The machine possesses emergency manual lowering device when there is a power failure

### The machine is configured according to the following assembly conditions:

- Foundation of machine (position for equipment installation and space)
- Frame of lifter (main structure of lifter and safety mechanism)
- Control cabinet (control part of the machine)

### Basic structure

The foundation of machine is composed by concrete structure and it is suggested that angle steel protection be set around the pit.

### Frame of lifter

It is composed by solid steel connecting leveler, main lifting platform, secondary lifting platform, prolonged back-wheel side sliding plate components, pneumatic double-tooth safety components and hydraulic oil cylinder components.

### Control cabinet

At the bottom of the control panel, there is a hydraulic control system such as hydraulic oil tank, hydraulic pump, hydraulic motor and hydraulic valve, etc. While the upper part is electrical control system



Scissor Lifter is designed to lift vehicles. It is not suitable for other occasions, especially for operation of washing and spraying. In addition, it shall not lift things heavier than the rated load.

# Hydraulic Scissor Lifter

## Chapter II Specification parameters

### Main technical parameters:

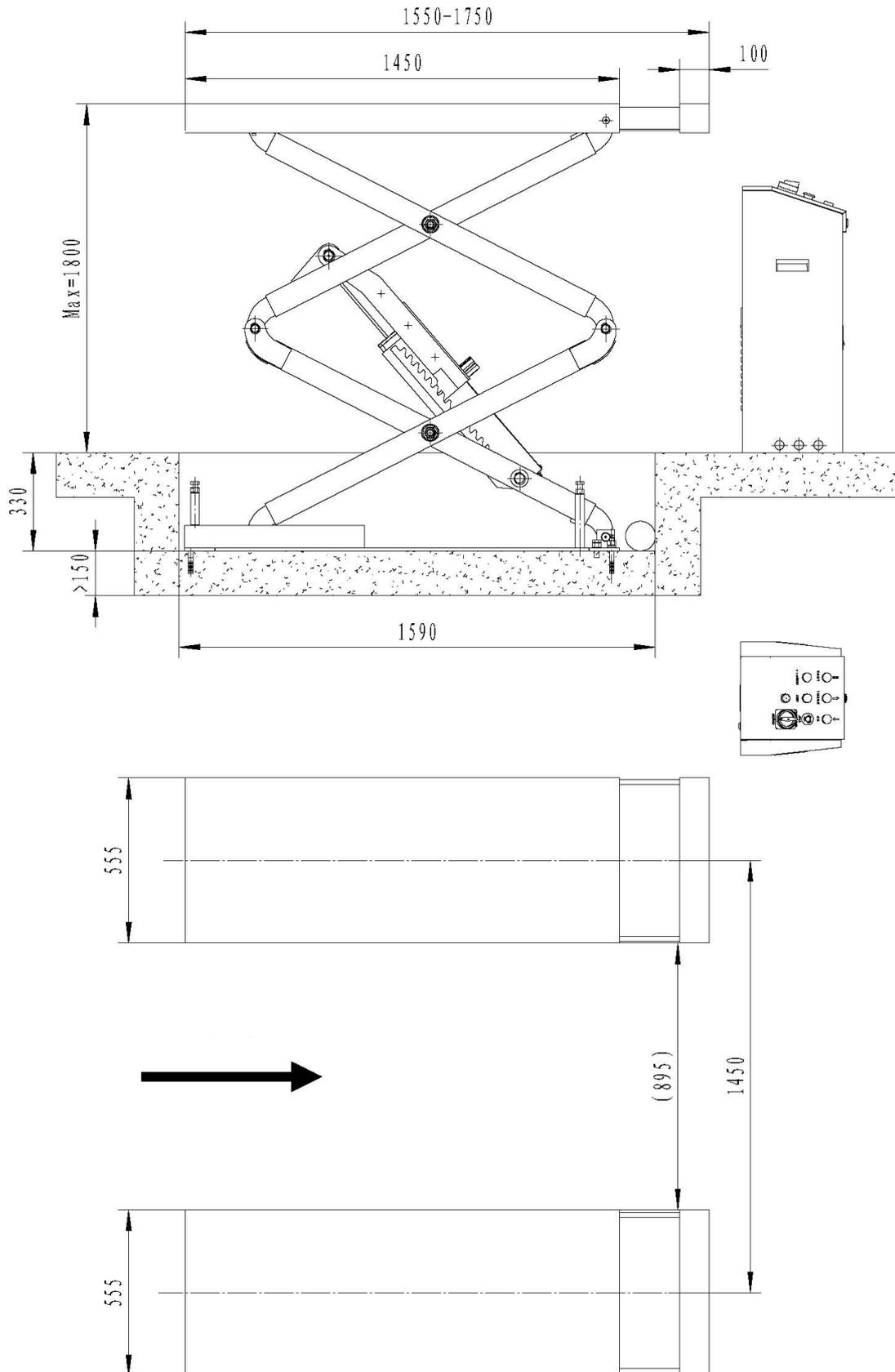
Machine type	SF-E3500
Driving method	Electro hydraulic
Rated lifting weight of host	3500kg
Hoist height of host	2130mm
Original height of platform	330mm
Length of platform	1550-1750mm
Width of platform	555mm
Lifting time	≤55s
Falling time	≤65s
Total width of platform of the whole machine	About1900mm
Total length of the whole machine	1550 mm
Weight of the whole machine	700Kg,
Power supply	AC 400or230V±5% 50Hz
Power of the whole machine	2.2kw
Hydraulic oil	16L The same as that of 20# wear-resistance hydraulic oil (user prepares it by himself/herself)
Pressure of air supply	6-8kg/cm <sup>2</sup>
Temperature of working environment	5-40℃
Humidity of working environment	30-95%
Noise of machine	< 76db
Height of installation of machine	Altitude≤2000M
Temperature for storage of machine	-25℃~55℃

Table 2

# Hydraulic Scissor Lifter

## Chapter II Specification parameters

### Overall dimensional diagram of SF-E3500



## Hydraulic Scissor Lifter

SF-E3500

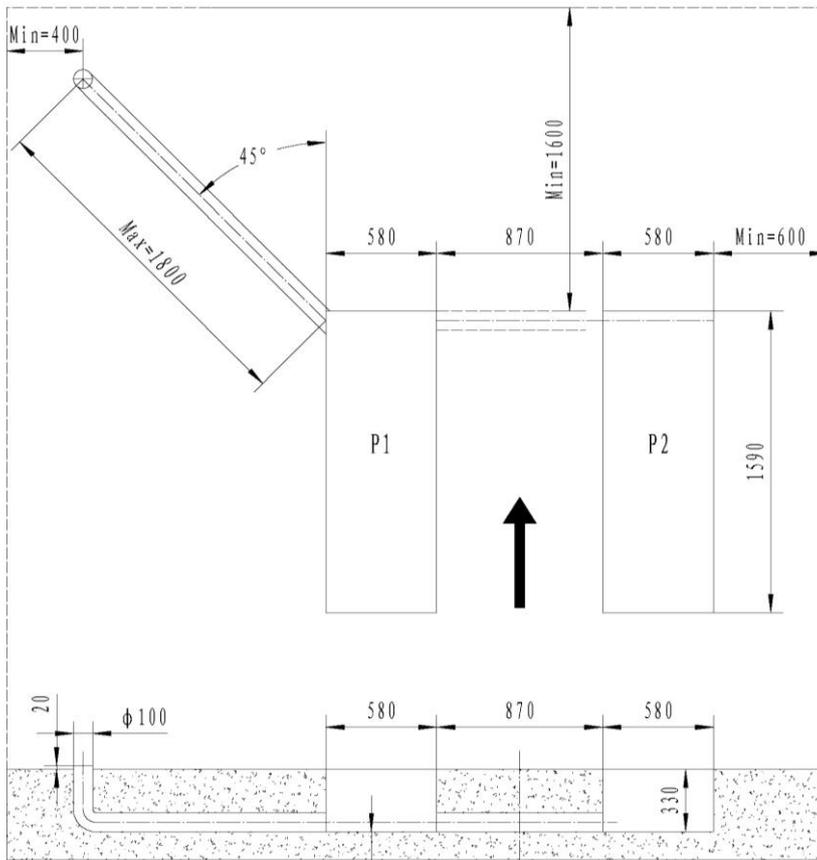
### Installation scheme of lifter

#### Attention: Basic requirements

- Concrete type is 425#, the dry period is 15 days
- Remove the internally generated surface in the foundation pit, the thickness of concrete at the pit bottom is  $\geq 150\text{mm}$
- The levelness of the two foundation pit is  $\leq 5\text{mm}$

#### Provide the following at the same time:

- Preliminarily bury the pit between the control panel and the foundation pit and the PVC pipe between the two pits that is no more than 100mm length, so as to connect oil pipe, gas pipe and wire.
- Connect to the power of the control panel (400V or 230V 15 A)
- Connect to the compressed air inlet tube on the control panel ( $\Phi 8 \times 5\text{mm}$ )



**Lifter fundamental figure** of SF-E3500 (the control cabinet can be placed left-right)



**Thickness and levelness of foundation concrete is extremely crucial. One shall not expect too much of level adjusting capability of the machine.**



The lower bottom of the vehicle may collide with parts of the lifter. When one drives the vehicle, one shall pay special attention to this.

The lifter can also hoist ordinary or non-standard vehicles, when the weight of vehicle does not exceeds the maximum hoist capability

There shall also be different definition of dimensions in personnel safety area



**There is important content in this chapter. Operators shall carefully read this chapter.**

The following content is explanation and description about danger and the possible danger during the operation, the correct effect and description of safety devices of equipment, other dangers, correct operating rules and potential dangers, etc.



**The designing and manufacturing of lifter is intended for hoisting and maintenance of vehicles. It is inappropriate for the hoisting of other goods. It is suitable especially for the following operation:**

**-Washing and cleaning of vehicles**

**-The hoisting operation where there are persons on the platform**

**-The hoisting operation of goods in bulk or broken goods**

**-It is applied as the elevator**

**-It is applied in vehicles with severely tilt frame or severe deformed tire**



The manufacturer bears no liability for personal injury or loss of property caused by incorrect operation or operation that violates the operating rules.

During the falling, operator shall operation within the safety area shown in the diagram.

As is shown in the diagram, operations by operator or other irrelevant personnel within this dangerous area are strictly forbidden.

Only when the vehicle is completely hoisted to the required position and the operation platform becomes still and the safety devices of the machine is completely prepared (such as the insurance gear is fully locked), can the operator and maintenance personnel be permitted to conduct operation under the vehicle.



**Lifter shall never be used when there are no safety protection devices**

**The might be casualty of personnel, damage of machine and damage of the vehicle that is to be hoisted if the operating rules mentioned above are not observed.**

### Overall Prevention

**Operator and maintenance personnel shall operate the machine according to the ordinance on safety formulated by the country where the lifter is located.**

In addition, operator and maintenance personnel shall:

-Conduct operation in the safety area required in the manual

-Make no alteration of the safety devices casually.

-Read carefully the safety warnings on the machine and the safety information in the manual

-Here are the safety warnings:



**Caution: Suggests the following operation will cause personal injury, damage of the lifter and vehicle or other loss of property.**



**Be Careful: It is the situation that is unsafe and might cause more personal casualty and loss of property.**



**Electric Shock: Safety mark in the place where the lifter might have an electric shock**

### Safety protection device

When the vehicle is on the hoisting platform, operator and maintenance personnel shall check the possible danger, the manufacturer also shall adopt various protection devices to avoid and reduce the occurrence of dangers as possible.

### The safety of personnel and vehicle shall operate according to the following rules:

- When the vehicle-hoisting, operator and maintenance personnel shall never enter the non-safe working area (in the lower part of the machine and the vehicle)
  - When the vehicle is placed on the platform, the engine of the vehicle shall be turned off and the brake shall be pulled tightly.
  - Make sure that the vehicle is at the correct position on the platform
  - Make sure only vehicles with weight, height and length being within the permitted scope of weight, maximum height and length can be hoisted.
- During the vehicle-hoisting, personnel shall never stay on the platform

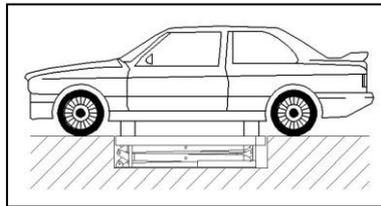


Figure 7

### The potential dangers during vehicle-hoisting:



The following safety devices are intended for protecting overloading or mechanical failure protection:

Under the situation of overloading, the overflow valve at the pump station will open and return oil into the oil tank.

Bottom of each oil cylinder is equipped with flow control valve. When some oil pipes crack in hydraulic circuit, the flow control valve will work and limit the speedy sliding and falling of the platform.

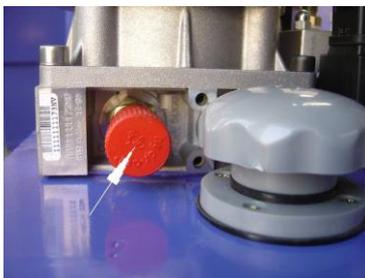


Diagram of pump station (overflow valve)      Throttle valve (oil cylinder bottom display)

Safety rack and gear and rack set of host guarantees personnel under the machine when other protection measures fail. It is necessary to make sure the safety gear and rack set is of perfect occlusion and the integrity of safety gear and rack set is good.



**There shall not be any foreign body on the assurance component so that the safety teeth can engage normally.**

**Danger of personnel**

This item suggests: the possible potential danger due to incorrect operation of operator and maintenance personnel any other personnel within the working area.



**Danger of extrusion**

Danger caused by personnel's failure in leaving the area mentioned above according to the rules when the lifter is hoisting or falling.

No personnel can work under the moving parts of the machine when the lifting platform is hoisting or falling. Personnel shall stay in safety position.



**Danger of impact:**

Operator can conduct hoisting and falling of the lifter when he/she has confirmed that there are no personnel within the dangerous area. Meanwhile, when the lifter is at a rather low height (less than 1.75 meter from the ground), since there is no color on the machine, impact of collision of personnel due to no color on the machine, shall be avoided.



**Danger of personnel falling down**

There shall be no personnel on the lifting platform or inside the vehicle that is to be hoisted when the lifter is hoisting or falling, so as to prevent them from falling.



**Danger of vehicle-moving:**

Danger cause by forcefully moving the vehicle



**Danger of vehicle-falling:**

Danger caused when vehicle is placed at the incorrect position, the over-weight of vehicle and the dimension of vehicle is not in accordance with standards.



**Never start the engine of vehicle to conduct hoisting or falling and testing on the lifting platform.**

**Never lay articles at the falling area and moving parts of the lifter.**



**Danger of sliding:**

Danger of personnel slipping due to oil pollutant on the ground in the surrounding of the lifter, the lower part of the lifter or the surrounding area and platform shall be clean. If there is oil pollutant, please remove it immediately.



**Danger of electric-shock:**

Danger of electric shock caused by damage of insulation of electrical equipment  
Never use water and steam, etc. to clean the machine, never use solvent or paint, etc. to approach the control panel of the lifter



**Danger caused by insufficient lighting:**

Operator and maintenance personnel shall install lighting required for working area of lifter operation in the corresponding position to prevent loss of parts and personal danger due to insufficient light.

Operator shall constantly observe the lifter and conduct operation within the position of operator due to hoisting and falling.

A rubber gasket should be arranged on the lower part of the chassis while lifting the vehicles.

**Never move the safety devices, Hoist weight shall not exceed the maximum hoist capability required for the machine and make sure that the machine is not over-loaded.**

It is necessary to operate according to the rules in the manual on using, maintenance and safety, etc.



**Only the specialized personnel can conduct installation. They shall carefully read and follow the following instructions to avoid damage of machine and personnel casualty.**

Only the authorized technicians can install the lifter.

The lifter shall be installed according to the specified distance between walls, columns and other facilities.

The minimum distance to wall surface is 1000 mm. To prevent against emergency and provide convenience to work, the sufficient space of safety channel shall also be taken into consideration.

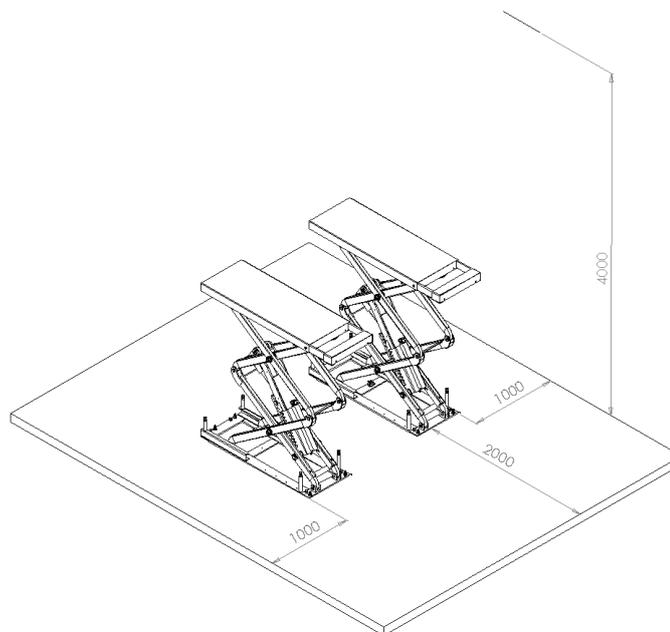
The site for installation shall be equipped with power supply and air supply, which are connected to the control panel.

Indoor height shall be no less than 4000mm.

It is suggested that the lifter be installed in the pit, according to installation foundation of construction in Figure 7 or Figure 8.

However, the machine can be installed in any indoor ground, as long as the ground is level and coincident to the requirements and the ground has sufficient weight tolerance ( $\cong 250\text{kg}/\text{cm}^2$ , and the thickness of the horizon cement concrete is  $\cong 150\text{mm}$ )

When the machine is to be installed, there shall be enough light to guarantee the safe operation of commissioning and maintenance and avoid the eyestrain of personnel caused by stimulated light.



It is necessary to check the completeness of the goods before the lifter is installed.

Moving and installation of lifter shall be conducted by specialized personnel.

See the \_ page “Transportation and Storage” for the transportation and storage of the machine

**Lifting platform installation**

-The yellow and dark warning bars are located on the lateral side and the oil cylinder bottom is located behind the machine (commissioning direction)

Fork lift truck or other hoisting equipment hoists the lifting platform; to hoist it to the height of about 1000MM to ensure that the safety device of the machine is on and locked

**To avoid failure of safety device of the machine, one wooden block can be inserted between the connecting rod.**



**Never work under the lifter when hydraulic system is not fully filled with hydraulic oil and there is hoisting and falling.**

-Move the lifting platform, adjust the distance between the two platforms and make sure the two platforms are in parallel position.

**Pipe connection:**

The circuit, oil-way and gas-way shall be connected according to *Electrical Connection Diagram and Oil-way Connection Diagram*.



The connecting of air-way can be conducted only after the connecting of the hydraulic system has been completed, Oil pipe、 wires and air pipe shall never be damaged, During the procedure the oil pipe and air pipe is traversing into the pit through the PVC pipe from the control panel, protection of connectors shall b given special attention to prevent rarities from entering the oil-way and air-way and damaging the hydraulic system.

**Electric circuit connection:**

Electric circuit shall be connected in accordance with wire diameters and wire number specified in *Electrical Connection Diagram*.



**Electric mounting operation shall be only carried by professionals with electric operation qualification.**

-Open upper cover of control cabinet

- Power cord connection: connect 400V three-phase four-wire system power cord (3×2.5mm<sup>2</sup>+1×1.5 mm<sup>2</sup> cable) to control panel L1, L2,L3 and incoming terminals; Connect PE ground wire to stud with grounding sign (Figure 25) and stud with grounding sign provided at the bottom of two platforms.

-If it is 230V three-phase power supply, control transformer and wire connection of motor is required to adjust.

-Sensor connection: the limit switch shall be installed on the switch frame of main platform bottom board



Limit switch diagram

### Connecting of hydraulic circuit

Connect hydraulic oil pipes according to *Oil-way Connection Diagram*.



**Only authorized specialized technicians can engage in the installation of hydraulic circuit, Pay special attention to oil pipe connector.**

- Lead out the high-pressure oil pipe from the “operation oil inlet a” and the “oil supplementation stop valve F” in the control platform according to the number of the oil pipe, and then connect the high-pressure oil pipe to the oil cylinder through a PVC pipe (see the “oil circuit connection diagram” for the details”)

**-When traversing PVC, the connector of air pipe shall be wrapped for protection to prevent rarities from entering the compressed air circuit.**



**When oil pipes are connected, be careful not to commit mistakes in numbering of oil pipes. In standard installation, the control panel is at the left of the direction when vehicle enters, if it is placed on the right, correspond oil pipes shall be adjusted.**

### Connecting of compressed air-way:

The connecting of air-way shall be in accordance with *Air-way Connection Diagram*.



**Only the authorized technicians with specialized qualifications can engage in the installation.**

-Connect the  $\Phi 8 \times 5$  air inlet pipe to the air inlet port of double oil-water separator at the control panel

-Introduce the  $\Phi 6 \times 4$  compressed air pipe from the air outlet of pneumatic solenoid valve of host and connect it to the air valve of claw-lifting

**-When thread PVC, pack the gas pipe connector in order to avoid foreign body entering compressed air circuit**



Control station aerodynamic solenoid valve diagram Lifting claw air valve diagram



**When thread the PVC pipe, gas pipe can not be folded and knotted in order to avoid unsmooth gas-way or blocked gas-way. The incoming pipe of compressed air shall be leaded into the oil-water separator and then leaded to inlet of solenoid air valve form the oil-water separator**

### Add oil and check phase sequence:

**After hydraulic circuit, electrical circuit and air-way are connected according to the annex, operate according to the following procedures:**

Open the control cabinet and fill 18L of 20# wear-resistance hydraulic oil into oil tank with funnel (the user shall provide hydraulic oil)

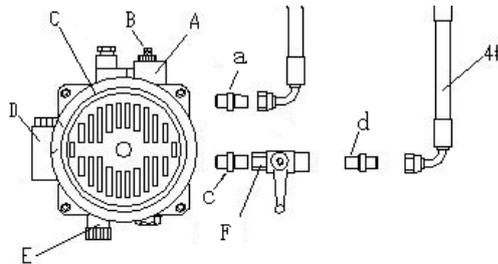


**When fill hydraulic oil, guarantee its cleanliness in order to avoid unsmooth oil-way caused by sundries and solenoid valve failure**

-Power on, press the “RISING” button and check whether the motor keeps a right rotation direction (the direction shall be clockwise from up to down). If the direction is opposite, cut off the power supply and adjust power supply phase sequence



**After the power supply is connected, high-voltage electric shock inside the control panel is likely to occur. Operation shall be only carried out by professionals with electric operation qualification and it is necessary to prevent electric shock.**



### Procedure for filling oil and releasing gas: instruction:

1. Shut the “filling-stopping valve F” (as the direction in the diagram)
2. Press “RISING” button and the machine will rise to about 1,000mm
3. Press “falling” button and the machine platform will fall to the lowest position
4. Lift the machine to about 1,400mm
5. Open the “operation-ending valve” in the control cabinet
6. Open the “filling-ending valve F” (turn 90°counterclockwise)
7. Press the “RISING” button to lift the machine to the same height with the two platforms
8. Shut the “filling-ending valve F”
9. Press the “FALLING” button and the machine will fall to the lowest position
10. Repeat the steps from Item 1 to Item 9 for 5-6 times and conduct automatic gas releasing
11. Finally, inch SB1 to lift the machine to about 1,400 (where it is the same as high as the two platforms)
12. Oil-filling and gas-releasing adjustment ends

**Inspection: whether the safety device of the two safety claws operates agilely and reliably and whether there exists leakage of oil-way and gas-way**

### Limit switch adjustment:

-Press the “RISING” button to lift the host to 2,130mm and adjust limit switch



**In the highest limit adjustment, the safety catch should be stopped on the position over the last tooth of the safety rack with 5 to 10 mm; of course the limit can be adjusted to any height according to the indoor height condition of the user**

- Descend the platform, ascend the host platform to the limit position for several times, and check whether the host limit is accurate and whether the operation is reliable



**If ceiling is lower than 4000MM, limit switch is regulated to the position with distance  $\leq 200$ MM of roof of vehicle after hoisted from the ceiling in order to avoid damaging vehicle and guarantee the safety of vehicle and person.**

### Installation of foundation bolt:



**The construction of foundation bolt shall be undertaken after the expiration of maintenance for concrete. Otherwise the strong quality shall be affected.**

-Adjust the left and right platform in alignment and the distance of the two platforms according to the requirements.

- Impact drill hammer of  $\Phi 18$  shall be drilled to the deep hole of 120mm from ground through base hole of platform with electric hammer pinch and entrance to hole shall be cleaned.

-Foundation bolt shall be installed in the holes with light hammer (without installing the central expansion nail of foundation, it shall be installed after leveling adjustment is completed.

### Leveling adjustment:

- Inspect the levelness on all sides of plan for left and right platform with transparent leveling pipe or level-mete.

-If the platform is not in a horizontal position due to the uneven foundation, put a piece of iron where it is low

-After leveling adjustment is completed, central expansion nail of foundation bolt shall be installed and hammered by with heavy hammer.

-Screw on the nut of foundation bolt



**When the guarantee period of concrete is not expired and central expansion nail of foundation bolt shall not be installed.**

**After leveling, the space between base plate and ground shall be filled with cement mortar.**

### Horizontal adjustment of low position:

When main platform falls to the lowest position, low leveling of platform shall be adjusted by adjusting the support adjusting screw at the lower of main platform.

-Undo fixed nut firstly.

-Adjust the length of support screw to suitable length.

### No-load test:

-Connect power supply switch, shut the “filling-ending valve F” and open the “operation oil inlet a”

-Press the “RISING” button and observe whether the two hosts’ platforms rise steadily and simultaneously

-Lift the platforms to the highest position and observe whether the maximum limit is accurate and reliable



**During test, there shall not be persons and other articles in the lifter rising and falling or regulated area. For any abnormal conditions, shut power supply general switch and commission once again after the failure is removed**

### Load test:

-Drive a car that weighs not more than the maximum lifting weight onto the platform and brake. The personnel in the car leave the car and platform

-Press the “RISING” button, lift host platform and observe whether hosts’ platforms rise steadily and simultaneously

-Inspect whether lifter frame and hydraulic pump station produce abnormal sound

-Lift the platforms to the highest position and observe whether the maximum limit is accurate and reliable



**During test, there shall not be persons and other articles in the lifter rising and falling or regulated area.**

**The weight of tested vehicle can not exceed the minimum lifting capacity of the lifter**  
**Inspect whether there exists oil or gas leakage in oil-way and gas-way. For any abnormal conditions, shut down the machine timely and commission once again after the failure is removed**

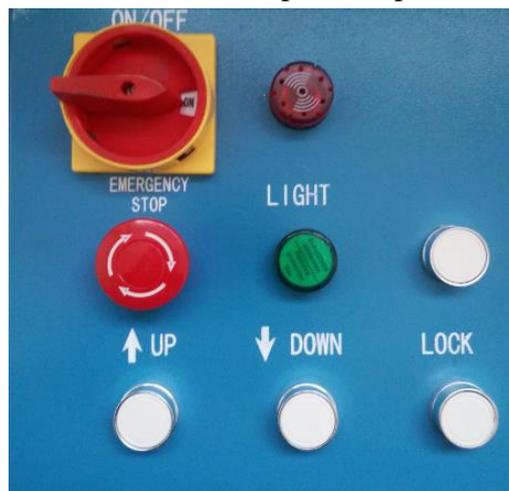


**Only operator that has been trained is allowed to operate the lifter. Inspect according to the following cautions**

**Operational cautions**

- The obstacle around and below the machine shall be removed before work
- During rising and falling, there shall not exist persons in the regulated area for the lifter, below the machine and in the vehicle on the platform
- The lifter can not lift vehicles and other goods that weighs beyond the lifter operation scope
- In lifting process, the position under the chassis of the vehicle should be provided with a rubber mat, and the active plate of the long wheelbase vehicle should be extracted.
- During rising and lifting, observe whether the platforms are simultaneous all the time. If abnormal conditions are found, stop the machine at once. The machine can be used again after inspection and the failure is removed
- During falling operation, observe whether the two safety claws are separated form the safety rack completely. Stop falling operation if they are not
- When the machine will not operate for a long time or during night, the platform shall be lowered to the lowest position on the ground, the vehicle shall be driven away and the power supply shall be cut

Electric operational instruction: (refer to operation panel diagram)



**Rising** -Press the “RISING” button. The oil pump operates. The hydraulic oil is conveyed to the hydraulic oil tank through “operation oil inlet a”. The platform arises and the safety goes up owing to gas –way connection

-Release the “RISING” button. The oil pump stops and safety claw stops rising. The safety claw falls down onto the safety rack due to power-off of solenoid air valve and gas-way closing

**Falling:**-Press “FALLING” button. The safety claw arises due to gas –way connection. Meanwhile, the solenoid valve for falling is powered on and opened. The platform falls. Release the “FALLING” button. The platform stops falling. The safety claw drops onto the safety rack

-When the safety claw engages in the safety rack, the platform shall be lifted a little (separate the safety claw from safety rack) and then lower the platform

### Filling and leveling operation (normal usage period)



After the machine is used, since the air in the oil cylinder is not released completely or the hydraulic oil is lost naturally or leaks leading to unevenness of the two platforms, filling adjustment shall be conducted.



There shall not be any load on the platform during filling and leveling

### Adjustment procedure:

- Lift the platform to about 500mm
- Open “filling-ending valve F” (turn 90°counterclockwise)
- Inch the “RISING” button and one side of the platform rises
- When the two platforms are in the same level, shut “filling-ending valve F”. The filling and adjusting procedure of host is finished

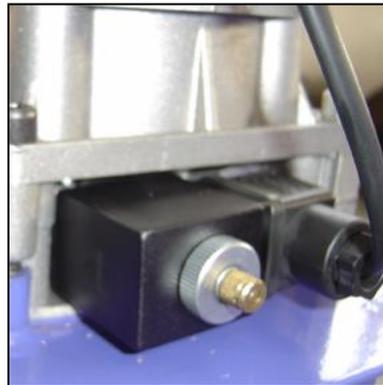
### Emergency falling through manual operation for power off



During falling through manual operation, observe the platform condition at all times due to vehicle on it. Turn the oil return valve at once in the case of abnormal situation

### Falling through manual operation procedure

- Lift the safety claws of the two platforms and underlay them with a piece of wood
- Shut power supply switch (in case of sudden powering on), open the control station back cover and find the solenoid valve A for falling
- Slowly turn the manual oil return stud at the valve plug end of the solenoid valve and the platform falls
- Turn back the manual oil return stud timely after the machine is lowered. The falling through manual operation is ended



### 5.1 Every day

- This machine shall be wiped and cleaned with dry cloth, for the purpose of keeping clean. Prior to wiping and cleanup, the power supply shall be cut off to guarantee the safety.
- Working environment of this machine shall be normally cleaned. If there is too much dust in working environment, machine wear will be sped up, and its service life will be shortened.
- Check all the safety structures carefully before operation on order to guarantee the flexible and reliable movement. For any abnormal conditions, related parts shall be adjusted, maintained or changed at once.
- Inspect whether it is dry and clean in the lifter tunnel
- Inspect whether the air pressure regulating valve leaks out and whether there is enough oil

### 5.2 Every month

- Foundation bolt shall be screwed down once again
- Inspect all the hydraulic pipes to confirm whether they are worn out and whether there exists oil leakage; If the oil leakage phenomenon is caused by wear of sealing elements, such sealing materials shall be timely replaced in accordance with original specification
- Inspect whether the roller slide-way is lubricated well. The 2# lithium base grease with high quality shall be applied.
- All the lubricating points shall be filled with 2# lithium base grease

### 5.3 Every six months

- Inspect wear, interference or damages may be caused to moving parts.
- Inspect lubricating condition for all rollers. If the dragging phenomenon occurs upon rising and falling period, appropriate amount of lubricating oil shall be applied to roller shaft.
- After the machine is put into initial use for six months, the hydraulic system shall be cleaned and oil shall be replaced. Later, N20 hydraulic oil shall be applied in winter and N46 hydraulic oil shall be applied in summer.

### 5.4 Every three years or operation of 5,000 times

- Change combined bushing of joints points
- Change seal ring at the connectors of the oil pipe



Machine faults solving shall be undertaken by operators having been trained with professional experience.

**Fault phenomenon and troubleshooting:**

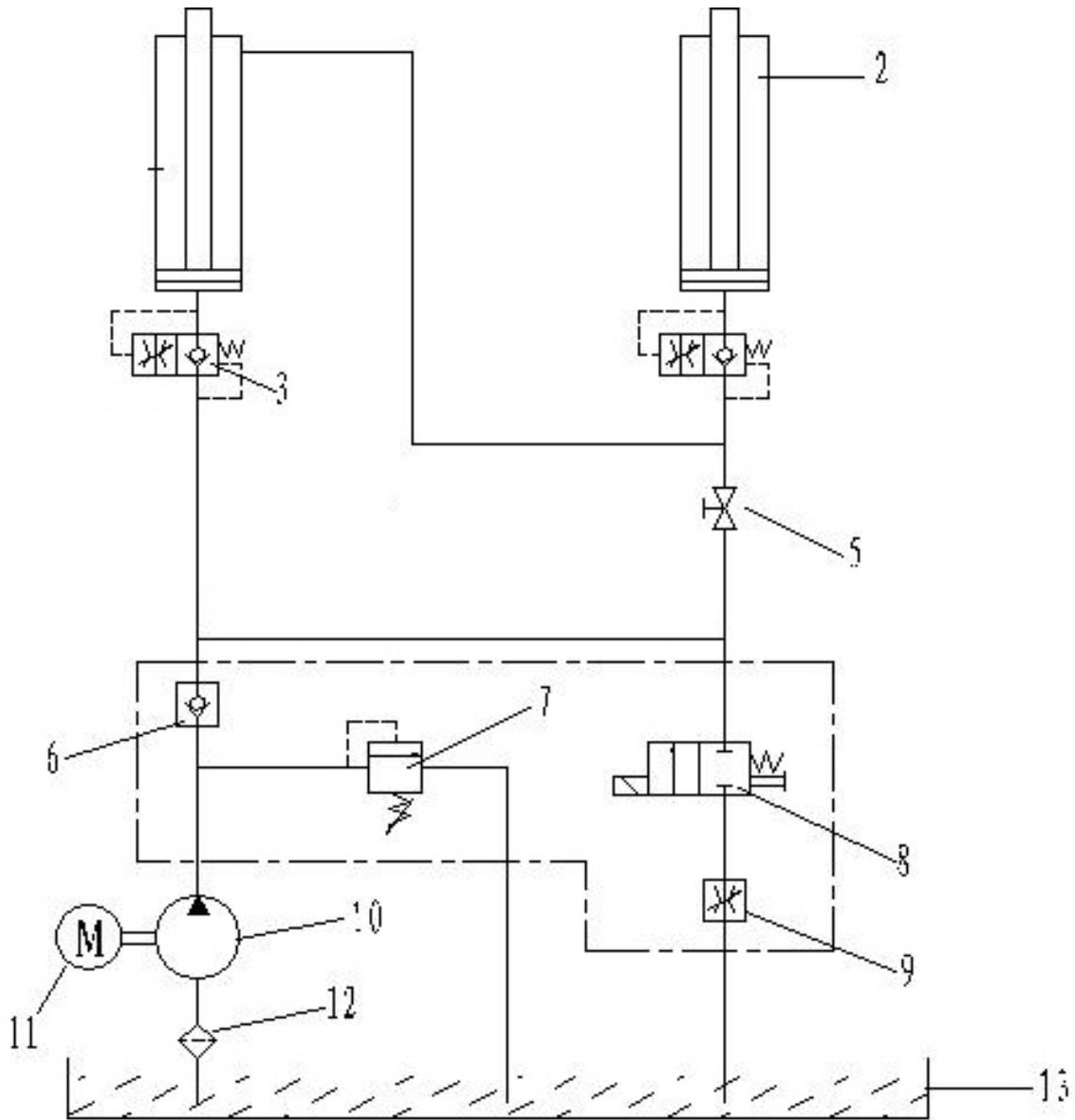
Fault phenomenon	Phenomenon and reasons	Troubleshooting
Motor fails to rotate upon pressing rising	① Abnormal power supply or zero line	After inspecting and eliminating, wires are connected
	② AC connector of main circuit for motor of pump is not connected	If motor shall operate after pressing motor by insulating rod, inspect control circuit. If the voltage of coil end for contactor is normal, contactor is replaced.
	③ Fault in limit switch occurs	If the faults are eliminated after the terminals connecting limit switch of 102# and 100# is short connected via wire, such limit switch and shall be inspected. Meanwhile, limit switch shall be adjusted or replaced.
	④ Button switch is damaged	Inspect contact point of button and wire for eliminating.
Motor can rotate but fail to rise upon pressing rising	① Motor rotates in reverse	Change incoming sequence of power supply
	② Motor shall rise with light load and it fails to rise with heavy load	Heighten the safety pressure setting of overflow valve by slightly screwing right. If there is dirt in the falling solenoid valve plug, clean the plug.
	② Hydraulic oil is not sufficient	Fill hydraulic oil.
	④ The releasing screw of solenoid valve for falling is not be screwed down	Screw down the releasing screw of solenoid valve for falling
Lifter fails to fall after pressing down button	① Safety claw is not separated from safety rack	The platform shall be lifted a little , then lower the platform.
	② Safety claw is not hoisted	Air pressure is insufficient, safety claw is blocked, or air pipe is broken. Regulate the pressure of air compressor and inspect air pipe for eliminating
	③ Solenoid air valve does not operate	Where since solenoid valve is power on but fails to operate, air circuit is not connected. Inspect or replace solenoid valve
	④ Solenoid valve in falling does not operate	Inspect the plug of solenoid valve in falling and coil and inspect whether the copper nut on the end is screwed or not

## Hydraulic Scissor Lifter

	⑤ Explosion-proof valve is blocked	Remove the “explosion-proof valve” in oil inlet hole at the bottom of oil cylinder of host or sub-machine and clean it
Lifter falls slowly under normal load	① Viscosity of hydraulic oil is too strong or frozen, goes bad(winter)	Replace with hydraulic oil or improve the temperature indoor according to the requirement of user’s manual
	② “Explosion-proof valve” preventing oil pipe from crack is blocked off	Remove or close air inlet pipe to make the safety claw of lifter is locked without hoisting. Remove the “explosion-proof valve” in oil inlet hole at the bottom of oil cylinder of host or sub-machine and clean it
Left and right platform are out of sync and unequal in height	① Air in oil cylinder is not exhausted	Refer to the filling and leveling operation
	② There is oil leak in oil pipe or connector	Screw on the connector or replace oil seal. Then filling and leveling are conducted
	③ “Filling-ending valve G or H” is not closed tightly and filling is needed nearly every day	Replace filling-ending valve and filling and leveling are conducted
Sound is generated when lifting and falling	① Lack of lubricating	Oil machine is applied to all hinged place and moving part(including piston) for lubricating
	② Base or machine is distorted	Adjust and level machine again and fill (pad) the base

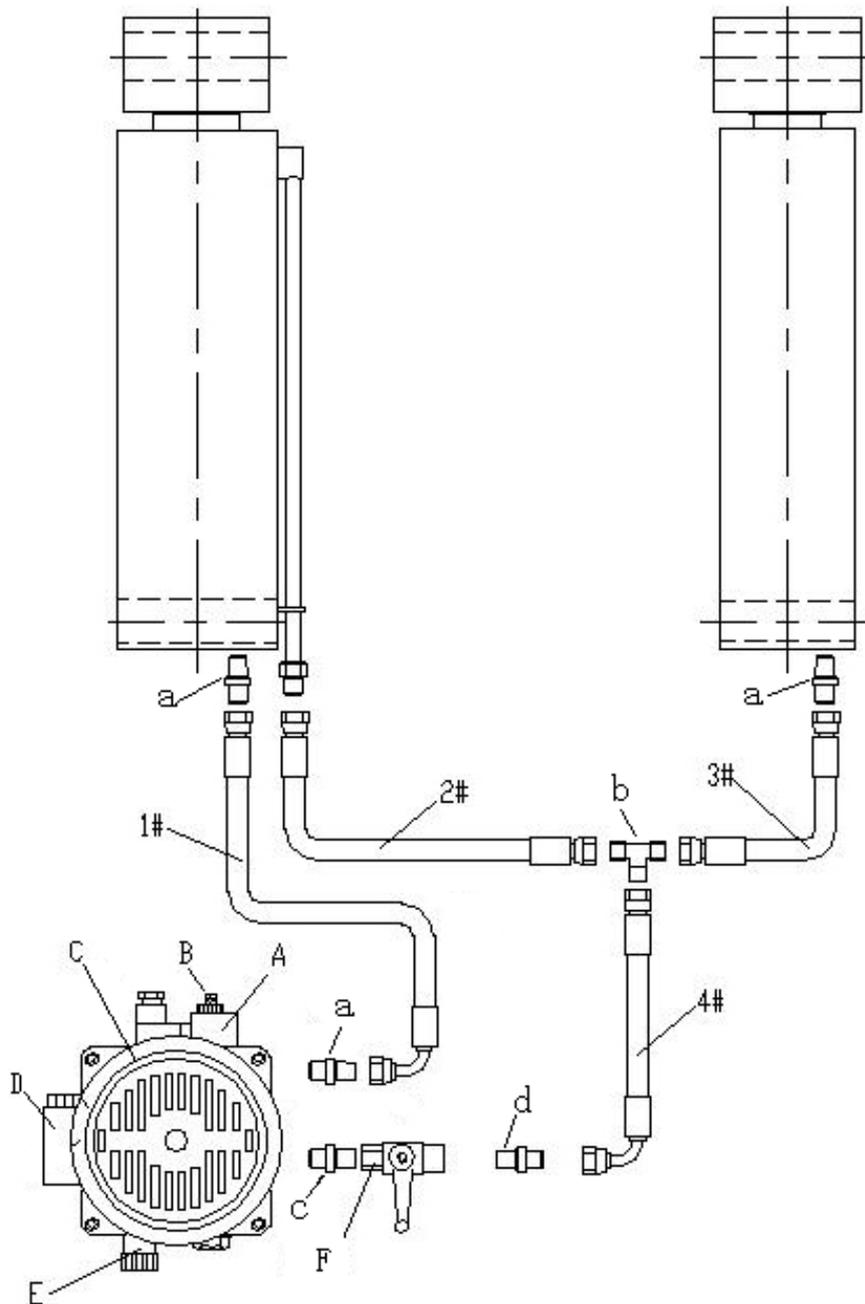
**Table 3**

Hydraulic schematic diagram for SF-E3500 small scissor plat lifter:



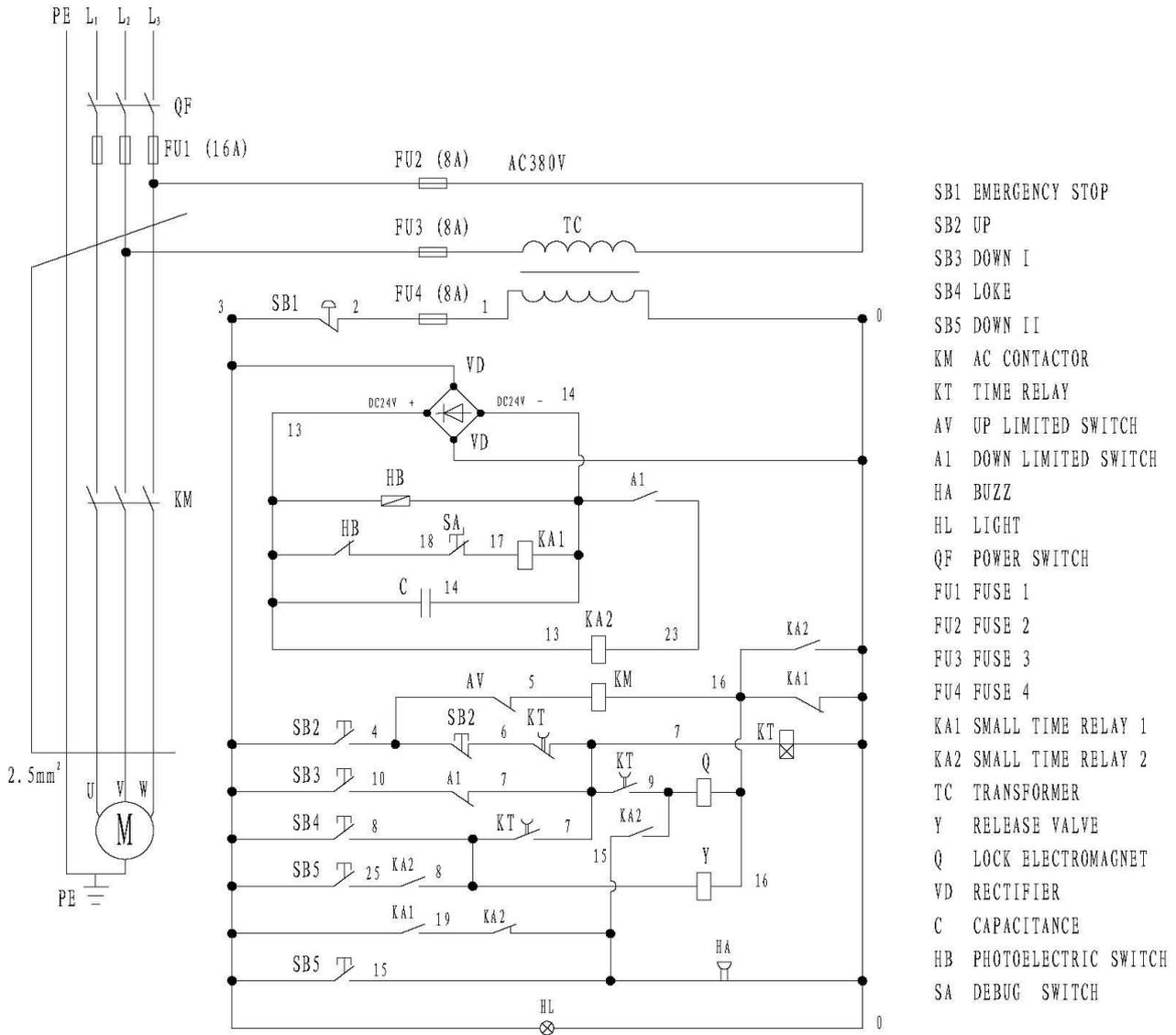
SF-E3500

Oil Circuit connection diagram of Small Scissor Flat Type Lifter:





Electric schematic diagram for SF-E3500



PE	L1	L2	L3	13	14	18	8	16	9	16	4	5	14	23	7	10	U	V	W	PE	
	POWER			PHOTOELECTRIC SWITCH		RELEASE VALVE		LOCK ELECTROMAGNET		UP LIMITED SWITCH		DOWN LIMITED SWITCH		MOTOR							



**The circuit diagram of small scissor is attached on the back of the control cabinet upper cover**

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Please fill the duplicate of guarantee and cut it along the dotted line. The guarantee is valid after it is sent to our company in registered letter.

Sales Department  
September 2011

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Product model		Product No.	
User's name		Contact person	
User's address		Telephone	
Operation organization		Purchase date	
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